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WORLD PRODUCTION SUPPLY, AND PRICE OF ROTENONE

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by

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WORLD PRODUCTION, SUPPLY, AND PRICE OF ROTENONE

During World War II, production of rotenone-bearing roots for the export market shifted from the Far East to the Western Hemisphere. Now that the shipping lanes are open again, there is some trade from the East Indies, but the bulk of United States imports is still coming from Peru. Questions of price; availability of supplies in the competing producing areas; transportation, packaging, and other marketing problems within the country and in consuming centers; and export policies of producing nations will all have a bearing on the future of the industry in the Western Hemisphere.

Production

Commercial rotenone root, a potent insecticide which is non-poisonous to man, is obtained from the roots of two legumes, derris and lonchocarpus. Derris is a product of the Orient, and lonchocarpus is a native of the American Tropics. The plant is called cube in Peru, the principal commercial producer in this Hemisphere, and timbó in Brazil. Although lonchocarpus grows wild in many parts of the American Tropics, these two countries are the principal sources for export. The Indians in these areas have long used the roots of the plants to stun fish, a practice resulting in the popular name of "barbasco", which is used to denote fish poisons in Spanish-speaking countries.

Before the war (1938-40) the world commercial production of rotenone-bearing roots averaged 9,750,000 pounds a year, of which Brazil and Peru accounted for 4,000,000 pounds. (Fig. 1) British Malaya and the Netherlands Indies were the important producers in the East, together supplying another 4,000,000 pounds. Since the early days of the World War II no production data on rotenone have come to us from the Orient. So far as an effective producer

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for the market is concerned, however, the Far East did not enter the picture during the War and is only now beginning to ship again. Intensive cultivation in Peru resulting from heavy demand, particularly from the United States, brought production in that country to high levels by the end of the war years. Estimated output in Peru alone in 1946 was 12,000,000 pounds, or one-quarter more than the total world production prewar. This amount, together with about 750,000 pounds from Brazil, constituted practically all the effective world production for market in that year. Expansion in the Peruvian production was from plantation growth centered largely in the Amazon region near Iquitos, stimulated by an agreement between the Governments of the United States and Peru. During the war years the United States was the sole purchaser of rotenone-bearing roots for use of this country and its Allies. Supplies were then handled under allocation to consuming centers in a manner similar to that followed for other scarce commodities. According to the understanding between the two Governments, the United States agreed to buy a specified quantity of roots from Peru at a guaranteed price. In April of 1946 a renewal of the agreement provided that the United States would guarantee to take at least 8,000,000 pounds of roots and powder at the following prices: 21 cents per pound FOB Iquitos and 21.5 cents FOB ocean port for roots; 26.5 cents per pound at Iquitos and 27 cents per pound at ocean ports for rotenone powder. The termination date of the agreement was May 7, 1947.

Consumption

At the present time the most important use of rotenone for which there is now no suitable substitute is in the control of the cattle grub. Its application in controlling this pest in the United States increased dramatically, rising from 150,000 pounds of 5 percent root in 1942 to an estimated 4,500,000 pounds in the current calendar year. Other insects for which rotenone is an effective control

The United States is the best market for rotenone-bearing roots. Before the war it took from 50 to 70 percent of all commercial production. During the war when this Hemisphere was the only producer, the United States served as the purchasing agent for the entire output, but later allocated certain quantities for Allied use. Since there is no production of rotenone-bearing roots in this country, all requirements must be imported. From 1937 through 1940 imports averaged 4,514,000 pounds, more than half of which come from Brazil and Peru. By 1947 imports had reached a peak of 13,413,000 pounds, 96 percent of which came from the Western Hemisphere. (Fig. 2) British Malaya derris re-entered the market in 1947, as did small quantities from the Philippines and Netherlands Indies. A new producer of derris is the Belgian Congo, which began shipments to the United States in 1945. In 1947 the total from that country had reached 140,000 pounds.

The greater part of our imports comes in in the form of roots for processing here, although from time to time small quantities are received in the ground or powdered state. There is a movement afoot in Peru, however, to increase the proportion of processed roots in the total export. The Corporación Peruana del Amazonas, a Government agency for the development of the Oriente, is interested in the construction of milling plants for the roots, such plants to be operated by the Corporación.

Imports of the crude rotenone-bearing roots enter this country free of duty, whereas a product of the root "advanced in value or condition" carries a duty of 10 percent ad valorem from all countries except Peru and Venezuela. From those countries the duty is 5 percent ad valorem.

Prices

Average import prices show an upward trend from 1938 through 1944. The price was fairly steady in 1944 and 1945, probably reflecting the low ceiling price [illegible]ed on the sale of rotenone-bearing roots to processors in mid-1944

as well as the contract price set in the rotenone agreement between the Governments of the United States and Peru. In 1946, however, prices resumed their upward movement, and by 1947 the average price of roots "advanced in value or condition" reached almost 42 cents per pound. (Fig. 3) The high prices, togetl with increased quantities imported raised the total import value of rotenone-bearing roots to $3,255,000, or almost ten times what it was ten years ago:

Table 1. - Total Value of Imports of Rotenone-bearing Roots

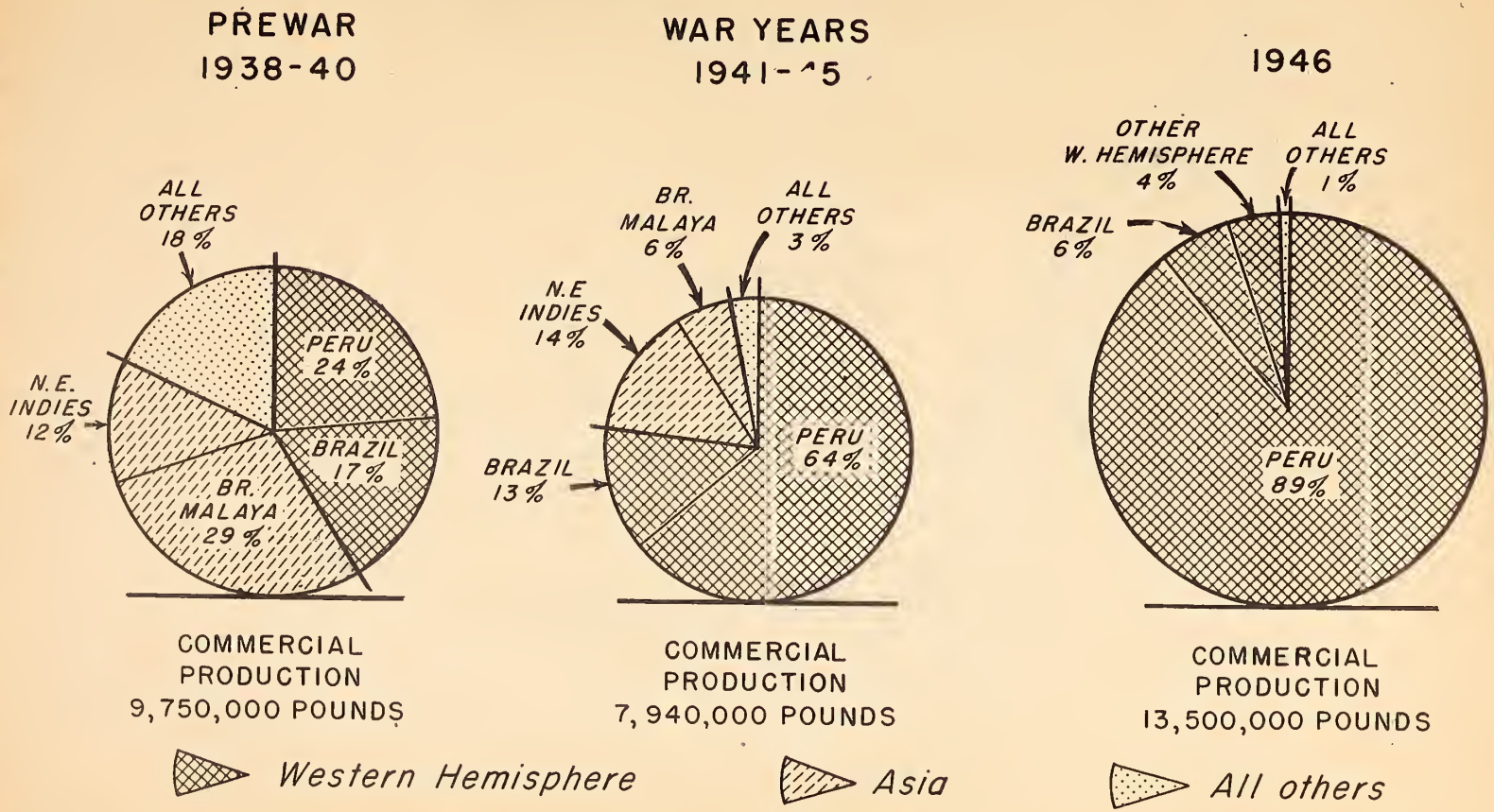
Year	1,000 dollars	Year	1,000 dollars
1937	343	1942	586
1938	383	1943	628
1939	614	1944	1,110
1940	671	1945	1,595
1941	897	1946	2,260
		1947	3,255

Outlook

With good returns for agricultural products and a backlog of demand for insecticides in this country to build up stocks of rotenone-bearing roots, imports in 1947 reached a record level in spite of extremely high prices. Assuming the ready availability of supplies at prices in line with agricultural products and competing insecticides, the United States could probably use 13,000,000 pounds of roots each year. In spite of competition from the synthetl insecticides such as DDT, chlordane, chlorinated camphene, and benzene hexachloride, rotenone remains an ideal insecticide for use on crop plants and in combating certain animal parasites because it leaves no poisonous residue. On the other hand, should undue difficulties be encountered in obtaining rotenon users in the United States will be encouraged to find new products to replace it entirely.

The source of United States imports will depend, in the future as in the past, on the relative price as between producing areas and the availability of a dependable supply. Trade restrictions of one kind or other, including export

ESTIMATED WORLD PRODUCTION OF ROTENONE-BEARING ROOTS



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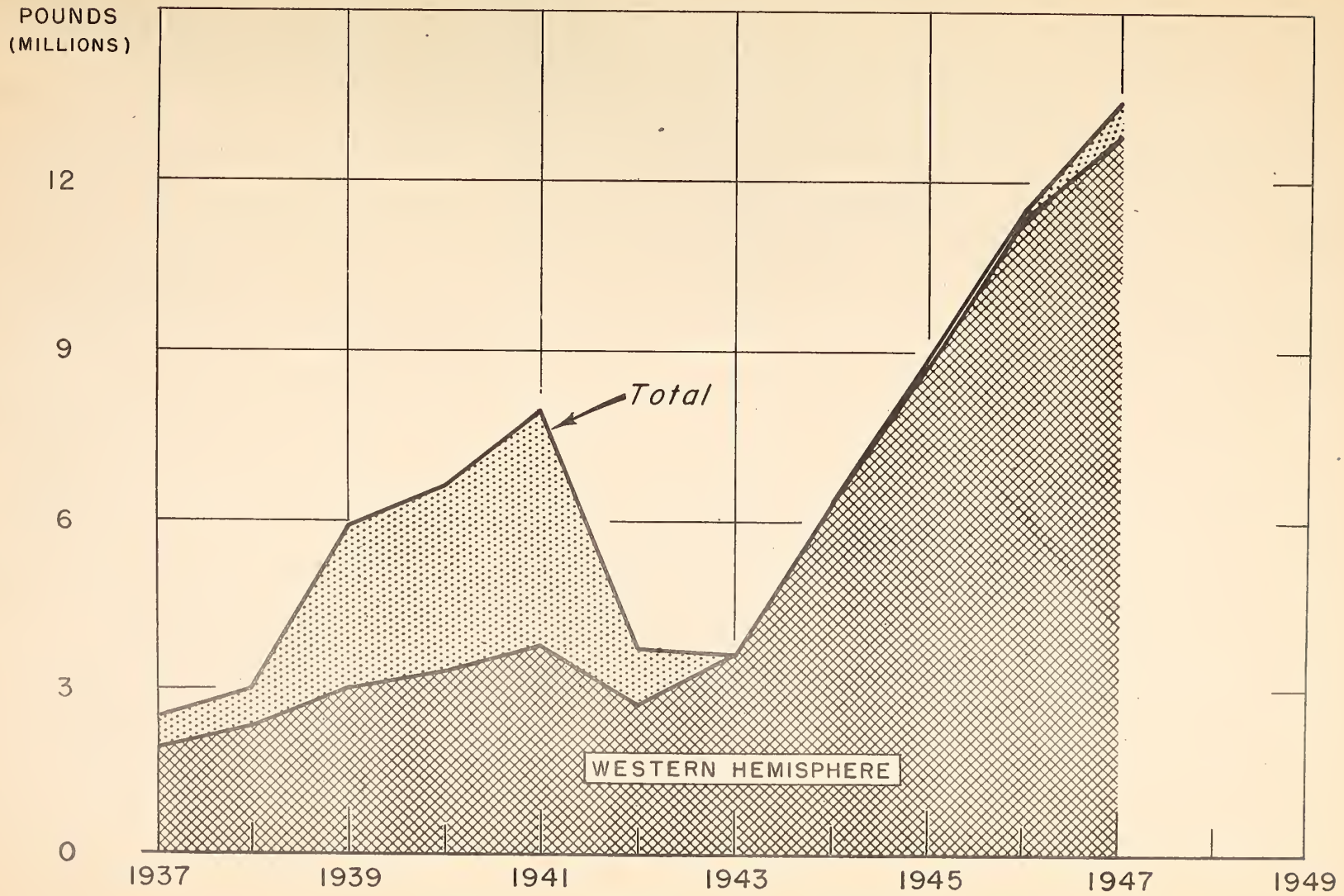
UNITED STATES IMPORTS OF ROTENONE-BEARING MATERIALS, TOTAL AND

UNITED STATES IMPORTS OF ROTENONE-BEARING MATERIALS, TOTAL AND FROM THE WESTERN HEMISPHERE, 1937-47



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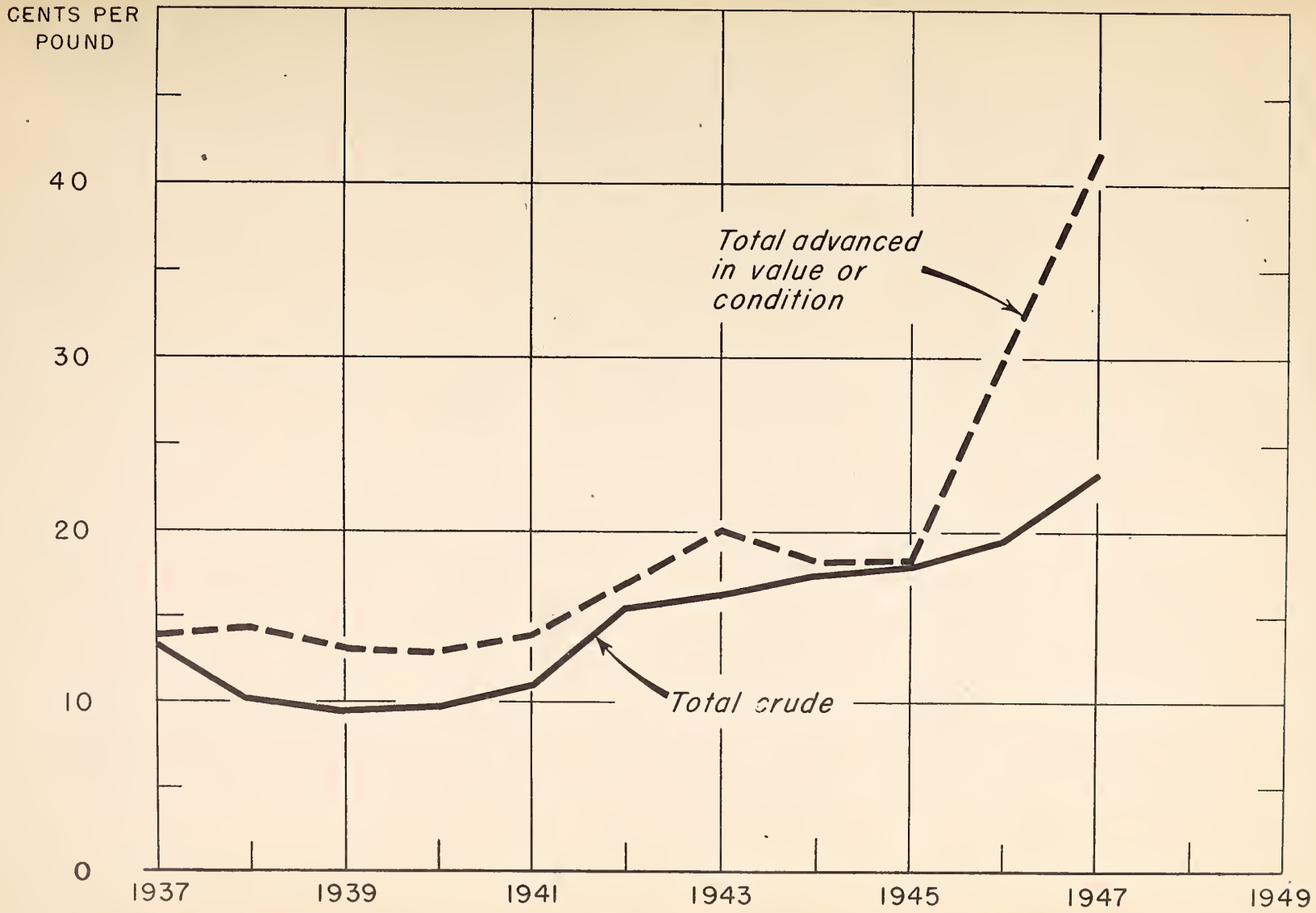
AVERAGE IMPORT PRICE OF ROTENONE-BEARING ROOTS, 1937-47



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time exports of rotenone-bearing roots from Peru are subject to a tax of four percent ad valorem. Exports through the Amazonian port of Iquitos (the principal port for cube) are taxed under Law 10637 of July 23, 1946 and those through maritime ports on the Pacific Ocean are taxed under Law No. 10749 of December 16, 1946. Proceeds from the first law are to be used for the National School and the Instituto Politecnico del Oriente of Iquitos, for experiment stations, and for foreign scholarships. Proceeds of the latter law are to be used to construct milling plants for processing cube. Tax collections under this law did not begin until October 8, 1947, but exporters are being billed for back taxes to the effective date of the law.

Particularly with regard to Western Hemisphere production, several technical problems of marketing and handling remain to be solved before the purchaser can be assured of a standardized product. With the availability of other insecticides that are competitive with rotenone, at least for many uses, buyers are becoming more critical than they were during the war years of faulty packaging and uncertain moisture content of the roots.

Table 2. - U. S. Imports of Rotenone-Bearing Roots, Ave. 1937-40, 1941-45, yearly 1946 and 1947, Quantity and Value

Commodity	Average 1937-40		Average 1941-45		1946		1947	
	1,000 lbs.	1,000 dol.	1,000 lbs.	1,000 dol.	1,000 lbs.	1,000 dol.	1,000 lbs.	1,000 dol.
Derris								
Crude	1,846	216	1,050	146	30	5	548	165
Advanced 1/	15	3	0	0	0	0	0	2/
Cube or Timbo								
Crude	1,475	122	3,640	562	10,998	2,152	12,242	2,829
Advanced 1/	1,178	161	1,412	255	341	103	618	260
Grand Total	4,514	502	6,102	963	11,369	2,260	13,413	3,254

1/Import classification "advanced in value or condition" does not separate cube and derris prior to 1939; the separation shown here assumes that imports from the Western Hemisphere are cube, those from the Orient, derris.